SPECIFICATION AMENDMENTS

Please amend the title appearing in lines 1-3 on page 1 of the specification as follows:

~~ANODE DESIGNS FOR PLANAR METAL DEPOSITS WITH ENHANCED ELECTROLYTE SOLUTION BLENDING AND PROCESS OF SUPPLYING ELECTROLYTE SOLUTION USING SUCH DESIGNS~~ METHOD OF SUPPLYING SOLUTION FOR ELECTROCHEMICAL PROCESSES FROM DOUBLE-CAVITY ELECTRODE HOUSING

Please amend paragraphs 7, 11, 12, 31, 32, 37, and 40 as follows.

[0007] U.S. Application No. 09/735,546 entitled METHOD AND APPARATUS FOR MAKING ELECTRICAL CONTACT TO WAFER SURFACE FOR FULL-FACE ELECTROPLATING OR ELECTROPOLISHING, filed on December 14, 2000, now U.S. Patent No. 6,482,307, describes in one aspect a technique for providing full face electroplating or electropolishing. U.S. Application No. 09/760,757, entitled METHOD AND APPARATUS FOR ELECTRODEPOSITION OF UNIFORM FILM WITH MINIMAL EDGE EXCLUSION ON SUBSTRATE, filed on January 17, 2001, describes in one aspect a technique for forming a flat conductive layer on a semiconductor wafer surface without losing space on the surface for electrical contacts.

[0011] Certain embodiments of a carrier head that may be used to hold the wafer 16 form the subject matter of co-pending U.S. patent application serial no. 09/472,523, titled WORK PIECE CARRIER HEAD FOR PLATING AND POLISHING, filed December 27, 1999, the disclosure of which is incorporated herein by reference as non-essential subject matter. Certain embodiments of anode assemblies with anode bags which are useable in

conjunction with such a carrier head form the subject matter of co-pending U.S. patent application serial no. 09/568,584, filed May 11, 2000, titled ANODE ASSEMBLY FOR PLATING AND PLANARIZING A CONDUCTIVE LAYER, now U.S. Patent 6,478,936, the disclosure of which is also incorporated herein by reference as non-essential subject matter.

[0012] A pad 8 is provided on top of a round anode assembly 9 across from the wafer surface. The pad 8 may have designs or structures such as those forming the subject matter of co-pending U.S. patent application serial no. 09/511,278, titled PAD DESIGNS AND STRUCTURES FOR A VERSATILE MATERIALS PROCESSING APPARATUS, filed February 23, 2000, now U.S. Patent 6,413,388. The disclosure of this co-pending application is also incorporated by reference herein as non-essential subject matter. Co-pending U.S. patent application serial no. 09/621,969, titled PAD DESIGNS AND STRUCTURES WITH IMPROVED FLUID DISTRIBUTION, filed July 21, 2000, now U.S. Patent 6,413,403, also relates to such pad designs and structures. The disclosure of application serial no. 09/621,969 is also incorporated by reference herein as non-essential subject matter.

[0031] A cavity A, within the anode housing 168, separates the primary anode filter element or elements 162 and the upper or secondary anode filter 166. The cavity or chamber A may be referred to as an inter-filter blending chamber. In this chamber A, the solution emanating from a lower anode chamber B blends or is mixed with solution from at least one primary flow channel 170. Together, the chambers A and B form an internal housing volume into which the electrolyte solution can flow. The filter 162 thus divides the internal housing volume into the lower anode chamber B and the inter-filter

blending chamber A, which is located between the lower anode chamber and a top anode plate 174. In the embodiment illustrated in Figure ~~14~~ 3, and in each of the embodiments shown in Figures ~~15-17~~ 4-6 which will be described, the blending of electrolyte solution in the chamber A and the higher velocity, or rate of flow, of the solution flowing from the primary flow channel enhance the migration of copper or other metal ions from the lower anode chamber B into the blending chamber A. This enhanced ion migration, in other words, is provided by the blending which occurs in the chamber A and because a flow of the electrolyte solution into the blending chamber A occurs at a higher rate than a flow of the solution into the anode chamber B. The dynamic mixing and migration reduce the copper ion concentration difference between the lower anode chamber B and the upper inter-filter blending chamber A, thus reducing cell polarization due to any large ion concentration differences in the cell.

[0032] The primary flow channel may be a vertical channel providing for electrolyte solution or fluid communication and can be incorporated into the anode housing. The primary and secondary flow channels can both be formed as apertures within the wall of the cell, as shown in Figure ~~14~~ 3. The primary flow channels 170 transfer the bulk of the solution, more than 60%, directly into the inter-filter blending chamber A. The solution is then filtered by the very fine upper anode filter 166, which has apertures that, typically, are less than 10.0μm, and preferably 0.02-0.5μm, in average diameter. The filtered solution then is transferred to the cathode via channels 172 in the anode top plate 174 and channels 176 in a pad or pad assembly 178. The top anode plate 174 forms a closure for the internal housing volume and is secured to a flange 175 defined at an upper end of the anode housing in any appropriate way such

as, for example, by bolts. The solution can thus be discharged from the internal housing volume towards the surface of a semiconductor substrate through the channels 172 in the top plate 174 and through the channels 176 in the pad or pad assembly. An O-ring seal 182 may be provided between an underside of the top anode plate 174 and the flange 175 to prevent leakage of plating or plating/planarization solution. The O-ring may be omitted to allow for controlled fluid leakage between the flanges. Controlled leakage may be used to remove bubbles in the mixing chamber. The top anode plate 174 may have essentially the same construction as the pad support plate 22 of co-pending U.S. Patent application serial no. 09/568,584 mentioned earlier, while the pad or pad assembly 178 may have essentially the same structure as the pad 8 of the same earlier mentioned application.

[0037] ~~A~~ As mentioned above, the external or inter-bowl filter 472 is disposed below the upper anode housing 468. This external filter can be mounted, e.g. by an appropriate filter mount, to a lower anode housing or bowl 495, and pre-filters the solution before it passes into the chambers A and B. The lower anode housing or bowl 495 defines a flange 497 which is connected, e.g. by bolts, to the flange 475 of the upper anode bowl or housing 468. An additional o-ring seal 492 can be disposed between facing surfaces of the flanges 475 and 497 to provide sealing. In all other aspects, the anode configuration of Figure 6 is constructed in the same way as that shown in Figure 3.

[0040] In other arrangements, the secondary flow to the lower anode chamber B may be tapped from the primary flow channel orifices as shown in Figure 4. Here, apertures narrower than those of the primary flow channels 270 form the secondary flow channels 280 and are used to partition or divert a

portion of the fluid in the primary channels 270 into the lower anode chamber B of the housing 268 surrounding the anode 264. In all other aspects, the anode configuration of Figure ~~15~~ 4 is constructed in the same way as that shown in Figure ~~14~~ 3.

DRAWING AMENDMENTS

Approval is requested for the changes to Figures 3, 5, and 6 highlighted on the sheets appended to this Preliminary Amendment.